PATENT ABSTRACTS OF JAPAN

(11)Publication number :   06-342302

(43)Date of publication of application : 13.12.1994

(51)Int.Cl.

```
         G05B 13/02
         B60K 41/00
         B60R 16/02
         B62D  6/00
      // B62D101:00
         B62D111:00
         B62D113:00
         B62D131:00
         B62D137:00
```

(21)Application number : 05-154263

(22)Date of filing :   31.05.1993

(71)Applicant : MAZDA MOTOR CORP

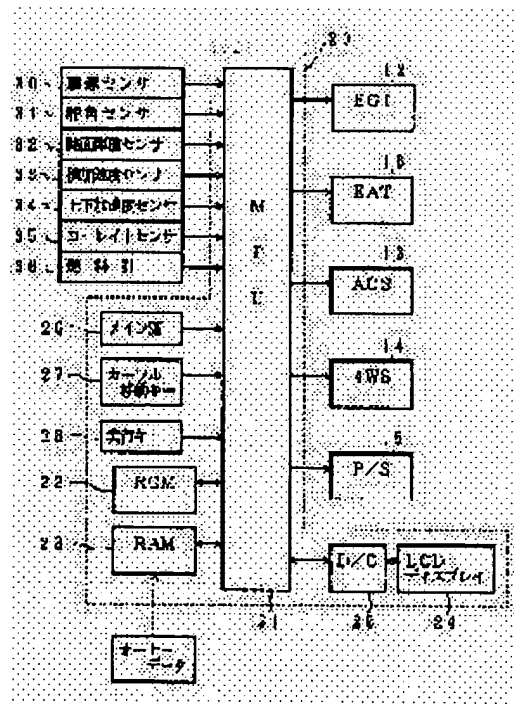(72)Inventor :   OMURA HIROSHI

SAKAMOTO KIYOSHI

TAKEHARA SHIN

IZUMI TOMOMI

(54) DEVICE AND METHOD FOR VARYING CONTROL GAIN OF CONTROLLER FOR VEHICLE

(57)Abstract:

PURPOSE: To perform data input for control gain variation efficiently, economically, and surely by the contol gain variation technology of the vehicle controller. CONSTITUTION: A control gain variation system 20 which varies the control gains of an engine controller 12, an active suspension oontroller 13, a 4-wheel steering controller 14, and a power steering controller 15 for an automobile consists of a control unit 21, a ROM 22 and a RAM 23, a display 24, etc.; and the RAM 23 is stored with owner characteristic data regarding the driving of the owner who has purchased the automobile and the ROM 22 is stored with various control programs and table data for the control gain variation. The owner characteristic data when stored in the RAM 23 can be written by a semiconductor integrated circuit maker and a controller maker or stored through

an IC card and an IC card reader which are equipped or not equipped with control varying system 20.

LEGAL STATUS

[Date of request for examination]   31.03.2000

[Date of sending the examiner's decision of
rejection]

[Kind of final disposal of application other than   abandonment
the examiner's decision of rejection or
application converted registration]

[Date of final disposal for application]   .   09.08.2001

[Patent number]

[Date of registration]

[Number of appeal against examiner's
decision of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] Are the control gain modification approach of changing the control gain of a control unit prepared in the car, and it sets to ** Co. Extract the owner proper data relevant to operation of the owner who ordered the car, and said owner proper data are supplied to the control unit manufacturer who manufactures some control units [at least] of the car of a semiconductor integrated circuit manufacturer or said owner. The semiconductor integrated circuit component which made the semiconductor integrated circuit component memorize owner proper data, and made said owner proper data memorize The control gain modification approach of the control unit for cars characterized by including in the control means for control gain modification of said car, and changing the control gain of said control unit using owner proper data by this control means.
[Claim 2] the car manufacturer who manufactures said control unit manufacturer and said car for the semiconductor integrated circuit component which made said owner proper data memorize, said ** Co., and ** -- the control gain modification approach of the control unit for cars according to claim 1 characterized by including in a control means in any one.
[Claim 3] While being the control gain modification approach of changing the control gain of a control unit prepared in the car and extracting the owner proper data relevant to operation of the owner who ordered the car in ** Co. Create the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and a data transmitting means is minded from said ** Co. The contents of the owner card are transmitted to the data receiving means of the control-device manufacturer who manufactures some control devices [at least] of the car of a semiconductor integrated circuit manufacturer's data receiving means, or said owner. In said semiconductor integrated circuit manufacturer or a control unit manufacturer, it is based on the contents of the received owner card. The semiconductor integrated circuit component which made the semiconductor integrated circuit component memorize said owner proper data, and made said owner proper data memorize The control gain modification approach of the control unit for cars characterized by including in the control means for control gain modification of the car supplied to said owner, and changing the control gain of said control unit using owner proper data by this control means.
[Claim 4] Are the control gain modification approach of changing the control gain of a control unit prepared in the car, and it sets to ** Co. Extract the owner proper data relevant to operation of the owner who ordered the car, and said owner proper data are supplied to a storage manufacturer. In this storage manufacturer, store owner proper data in a storage, and the storage reading means connected to the control means for control gain modification of said owner's car free [the attachment and detachment to this control means] is minded. The control gain modification approach of the control unit for cars characterized by making the owner proper data memorized to the storage read and memorize, and changing the control gain of said control unit using owner proper data by said control means.
[Claim 5] the control unit manufacturer who manufactures some control units [at least] of said car, the car manufacturer who manufactures said car, said ** Co., and ** -- the control gain modification approach of the control unit for cars according to claim 4 characterized by making a control means

memorize the owner proper data memorized to said storage in any one.

[Claim 6] While being the control gain modification approach of changing the control gain of a control unit prepared in the car and extracting the owner proper data relevant to operation of the owner who ordered the car in ** Co. Create the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and a data transmitting means is minded from said ** Co. Transmit the contents of said owner card to a storage manufacturer's data receiving means, and it sets to this storage manufacturer. Based on the contents of the received owner card, store owner proper data in a storage and the storage reading means connected to the control means for control gain modification of the car supplied to said owner free [the attachment and detachment to this control means] is minded. The control gain modification approach of the control unit for cars characterized by making the owner proper data memorized to the storage read and memorize, and changing the control gain of said control unit using owner proper data by said control means.

[Claim 7] Are the control gain modification approach of changing the control gain of a control unit prepared in the car, and it sets to ** Co. Extract the owner proper data relevant to operation of the owner who ordered the car, and said owner proper data are supplied to a storage manufacturer. Owner proper data are stored in a storage in this storage manufacturer. For control gain modification of said owner's car, it is connected and prepared in this control means, and the storage reading means with which it can equip free [attachment and detachment] is minded for said storage. The control gain modification approach of the control unit for cars characterized by reading and transmitting owner proper data from said storage, and changing the control gain of the **** aforementioned control unit for owner proper data by said control means.

[Claim 8] While being the control gain modification approach of changing the control gain of a control unit prepared in the car and extracting the owner proper data relevant to operation of the owner who ordered the car in ** Co. Create the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and a data transmitting means is minded from said ** Co. Transmit the contents of said owner card to a storage manufacturer's data receiving means, and it sets to this storage manufacturer. Said owner proper data are stored in a storage based on the contents of the received owner card. For control gain modification of the car supplied to said owner, it is connected and prepared in this control means, and the storage reading means with which it can equip free [attachment and detachment] is minded for said storage. The control gain modification approach of the control unit for cars characterized by reading and transmitting owner proper data from said storage, and changing the control gain of the **** aforementioned control unit for owner proper data by said control means.

[Claim 9] The semiconductor integrated circuit component which it is [component] control gain modification equipment which changes the control gain of a control unit prepared in the car, and made the owner proper data relevant to operation of the owner who ordered the car memorize, Control gain modification equipment of the control unit for cars characterized by having a control gain modification means to change the control gain of said control unit, based on the owner proper data which said semiconductor integrated circuit component was incorporated and were memorized for this semiconductor integrated circuit component.

[Claim 10] A storage read means is minded from the storage which it is [storage] control gain modification equipment which changes the control gain of a control unit prepared in the car, and made the owner proper data relevant to operation of the owner who ordered the car memorize. A data storage means by which said owner proper data are read and memorized, Control gain modification equipment of the control unit for cars characterized by having a control gain modification means to change the control gain of said control unit, based on the owner proper data which said data storage means was incorporated and were memorized for this data storage means.

[Claim 11] The storage which made the owner proper data relevant to operation of the owner who is control gain modification equipment which changes the control gain of a control unit prepared in the car, and ordered the car memorize in a storage manufacturer, It connects with a storage read means by which it is equipped with said storage free [attachment and detachment], and said storage read means. Control gain modification equipment of the control unit for cars characterized by having a control gain

modification means to change the control gain of said control unit based on this owner proper data, in response to the owner proper data read in the storage with the storage read means.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] Especially this invention relates to the technique which aimed at increment control in cost for control gain modification about the control gain modification equipment of the control unit for cars, and the control gain modification approach.
[0002]
[Description of the Prior Art] By the conventional car, no matter many and unspecified drivers may run where in what the operating environment and condition, the control gain of the control unit of the drive system of a car, a suspension system, and a steering system is set up so that a fixed satisfaction level may be obtained. However, practical use is presented also with what was constituted so that a selection setup only of the control gain of the control unit of a specific fraction, such as choosing a power mode and normal mode, choosing one of the requests in control mode [in active suspension equipment], hard mode, and software mode, or choosing the sport mode and normal mode in a four-flower power steering system according to liking of each driver, could be carried out.
[0003] Furthermore, the learning-control automobile which learned the description on operation of a driver and enabled modification of the control gain of a transit property is also proposed. For example, the learning-control automobile which carries out learning control so that the steering angular velocity under steering, a steering angle, a yaw rate, lateral acceleration, etc. may be sampled to JP,3-44029,B, the description of steering of a driver may be extracted to it based on the average value within predetermined time and the ratio of the steering angle of the front wheel and/or rear wheel to the steering angle of a steering wheel may be changed into it is proposed.
[0004]
[Problem(s) to be Solved by the Invention] the control gain modification technique of the conventional car can be changed into the property for which it is only being able to change the control gain of one specific control device into two or more kinds which the manufacturer's set up, and a driver wishes -- as -- the control gain of two or more control devices, such as a drive system of about [constitute] and a car, a suspension system, and a steering system, is changed into a desired property -- as -- it is not constituted.
[0005] It is possible to constitute possible [modification in the property of owner-driver's request of the control characteristic of two or more control devices of a car]. Then, an applicant for this patent The owner who purchased the car is provided with a special gain modification machine and its manual in previous application. An input setup of the data (data, such as the description on the purpose of use, a use mode, and operation) of the owner proper for control gain modification of a car is carried out. In the control gain modification system which supplies the data to the control gain modification equipment of a car through a storage etc., and ** Co. which sold the car, the control gain modification system which carries out an input setup of said owner proper data at the control gain modification equipment of a car was proposed.
[0006] However, in order that it is necessary to provide owner with a special gain modification machine

and each owner may perform a data input in the case of the control gain modification system of said former, the increment in cost is caused and there are problems, like troubles, such as a data input mistake by requiring a great effort and owner, may arise. In the case of the control gain modification system of said latter, in order to make much ** Co. equip the device for data inputs, there are problems, like causing the increment in cost and an owner proper entry-of-data setup in ** Co. takes a great effort. The purpose of this invention is being able to perform the data input for control gain modification economically efficiently, and offering the control gain modification equipment of the advantageous control unit for cars in cost, and the control gain modification approach.
[0007]
[Means for Solving the Problem] The control gain modification approach of the control unit for cars of claim 1 Are the control gain modification approach of changing the control gain of a control unit prepared in the car, and it sets to ** Co. Extract the owner proper data relevant to operation of the owner who ordered the car, and said owner proper data are supplied to the control unit manufacturer who manufactures some control units [at least] of the car of a semiconductor integrated circuit manufacturer or said owner. The semiconductor integrated circuit component which made the semiconductor integrated circuit component memorize owner proper data, and made said owner proper data memorize It includes in the control means for control gain modification of said car, and the control gain of said control unit is changed using owner proper data by this control means.
[0008] the car manufacturer to whom the control gain modification approach of claim 2 manufactures said control unit manufacturer and said car for the semiconductor integrated circuit component which made said owner proper data memorize in the approach of claim 1, said ** Co., and ** -- in any one, it includes in a control means.
[0009] The control gain modification approach of the control unit for cars of claim 3 While being the control gain modification approach of changing the control gain of a control unit prepared in the car and extracting the owner proper data relevant to operation of the owner who ordered the car in ** Co. Create the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and a data transmitting means is minded from said ** Co. The contents of the owner card are transmitted to the data receiving means of the control-device manufacturer who manufactures some control devices [at least] of the car of a semiconductor integrated circuit manufacturer's data receiving means, or said owner. In said semiconductor integrated circuit manufacturer or a control unit manufacturer, it is based on the contents of the received owner card. The semiconductor integrated circuit component which made the semiconductor integrated circuit component memorize said owner proper data, and made said owner proper data memorize It includes in the control means for control gain modification of the car supplied to said owner, and the control gain of said control unit is changed using owner proper data by this control means.
[0010] The control gain modification approach of the control unit for cars of claim 4 Are the control gain modification approach of changing the control gain of a control unit prepared in the car, and it sets to ** Co. Extract the owner proper data relevant to operation of the owner who ordered the car, and said owner proper data are supplied to a storage manufacturer. In this storage manufacturer, store owner proper data in a storage, and the storage reading means connected to the control means for control gain modification of said owner's car free [the attachment and detachment to this control means] is minded. The owner proper data memorized to the storage are made to read and memorize, and the control gain of said control unit is changed using owner proper data by said control means.
[0011] the control unit manufacturer to whom the control gain modification approach of claim 5 manufactures some control units [at least] of said car in the approach of claim 4, the car manufacturer who manufactures said car, said ** Co., and ** -- a control means is made to memorize the owner proper data memorized to said storage in any one
[0012] The control gain modification approach of the control unit for cars of claim 6 While being the control gain modification approach of changing the control gain of a control unit prepared in the car and extracting the owner proper data relevant to operation of the owner who ordered the car in ** Co. Create the owner card containing the car data for specifying the car which this owner proper data and owner

ordered, and a data transmitting means is minded from said ** Co. Transmit the contents of said owner card to a storage manufacturer's data receiving means, and it sets to this storage manufacturer. Based on the contents of the received owner card, store owner proper data in a storage and the storage reading means connected to the control means for control gain modification of the car supplied to said owner free [the attachment and detachment to this control means] is minded. The owner proper data memorized to the storage are made to read and memorize, and the control gain of said control unit is changed using owner proper data by said control means.

[0013] The control gain modification approach of the control unit for cars of claim 7 Are the control gain modification approach of changing the control gain of a control unit prepared in the car, and it sets to ** Co. Extract the owner proper data relevant to operation of the owner who ordered the car, and said owner proper data are supplied to a storage manufacturer. Owner proper data are stored in a storage in this storage manufacturer. For control gain modification of said owner's car, it is connected and prepared in this control means, and the storage reading means with which it can equip free [attachment and detachment] is minded for said storage. Owner proper data are read and transmitted from said storage, and the control gain of the **** aforementioned control unit for owner proper data is changed by said control means.

[0014] The control gain modification approach of the control unit for cars of claim 8 While being the control gain modification approach of changing the control gain of a control unit prepared in the car and extracting the owner proper data relevant to operation of the owner who ordered the car in ** Co. Create the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and a data transmitting means is minded from said ** Co. Transmit the contents of said owner card to a storage manufacturer's data receiving means, and it sets to this storage manufacturer. Said owner proper data are stored in a storage based on the contents of the received owner card. For control gain modification of the car supplied to said owner, it is connected and prepared in this control means, and the storage reading means with which it can equip free [attachment and detachment] is minded for said storage. Owner proper data are read and transmitted from said storage, and the control gain of the **** aforementioned control unit for owner proper data is changed by said control means.

[0015] The control gain modification equipment of the control unit for cars of claim 9 The semiconductor integrated circuit component which it is [component] control gain modification equipment which changes the control gain of a control unit prepared in the car, and made the owner proper data relevant to operation of the owner who ordered the car memorize, Said semiconductor integrated circuit component is incorporated and it has a control gain modification means to change the control gain of said control unit, based on the owner proper data memorized for this semiconductor integrated circuit component.

[0016] The control gain modification equipment of the control unit for cars of claim 10 A storage read means is minded from the storage which it is [storage] control gain modification equipment which changes the control gain of a control unit prepared in the car, and made the owner proper data relevant to operation of the owner who ordered the car memorize. It has a data storage means by which said owner proper data are read and memorized, and a control gain modification means to change the control gain of said control unit based on the owner proper data which said data storage means was incorporated and were memorized for this data storage means.

[0017] The control gain modification equipment of the control unit for cars of claim 11 The storage which made the owner proper data relevant to operation of the owner who is control gain modification equipment which changes the control gain of a control unit prepared in the car, and ordered the car memorize in a storage manufacturer, It connects with a storage read means by which it is equipped with said storage free [attachment and detachment], and said storage read means. In response to the owner proper data read in the storage with the storage read means, it has a control gain modification means to change the control gain of said control unit based on this owner proper data.

[0018]
[Function and Effect of the Invention] In the control gain modification approach of claim 1, supply the owner proper data relevant to operation of the owner who extracted in ** Co. to a semiconductor

integrated circuit manufacturer or a control unit manufacturer, a semiconductor integrated circuit component is made to memorize them, it includes in the control means for control gain modification of the car with which owner placed an order for the semiconductor integrated circuit component, and the control gain of a control unit is changed using owner proper data by the control means. Therefore, a semiconductor integrated circuit component can be made to memorize owner proper data certainly efficiently through a predetermined device in a semiconductor integrated circuit manufacturer or a control unit manufacturer. And since it can utilize common to many cars and said predetermined device does not need to equip much ** Co. and many owner with a special device, it is very advantageous in cost in respect of a facility and an effort.

[0019] In the control gain modification approach of claim 2, the semiconductor integrated circuit component which made owner proper data memorize will be included in a control means in any one of a control unit manufacturer, a car manufacturer, and ** Co.

[0020] In the control gain modification approach of claim 3, although the same operation and effectiveness as claim 1 and abbreviation are acquired, it creates the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and transmits the contents of this owner card to a semiconductor integrated circuit manufacturer's receiving means through a data transmitting means while ** Co. extracts owner proper data. A semiconductor integrated circuit manufacturer stores owner proper data in a semiconductor integrated circuit based on the contents of the received owner card. And this semiconductor integrated circuit will be built into the control means of the car supplied to owner based on the contents of the owner card.

[0021] In the control gain modification approach of claim 4, owner proper data are stored in a storage in a storage manufacturer, the control means for control gain modification of owner's car is made to read and memorize the owner proper data of a storage through a storage reading means, and the control gain of the control unit of a car is changed into it using owner proper data by the control means. By this control gain modification approach, the same operation and effectiveness as claim 1 are fundamentally acquired only by differing from claim 1 at the point which store owner proper data in a storage, and reads that data through a storage reading means, and a control means is made to memorize.

[0022] A control means is made to memorize the owner proper data memorized to the storage in the control gain modification approach of claim 5 in any one of a control unit manufacturer, a car manufacturer, and ** Co.

[0023] In the control gain modification approach of claim 6, although the same operation and effectiveness as claim 4 and abbreviation are acquired, it creates the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and transmits the contents of this owner card to a storage manufacturer's receiving means through a data transmitting means while ** Co. extracts owner proper data. A storage manufacturer stores owner proper data in a storage based on the contents of the received owner card. And the owner proper data of this storage will be memorized by the control means of the car supplied to owner through a storage read means based on the contents of the owner card.

[0024] In the control gain modification approach of claim 7, owner proper data are stored in a storage in a storage manufacturer, and through the storage reading means connected and formed in the control means for control gain modification of owner's car, owner proper data are read, it transmits to a control means, and the control gain of the control unit of the **** car for owner proper data is changed by the control means. By this control gain modification approach, in the storage manufacturer of what needs to establish the storage reading means connected to the control means of owner's car, owner proper data can be economically stored in a storage efficiently certainly, and the same operation and effectiveness as claim 1 and abbreviation are acquired.

[0025] In the control gain modification approach of claim 8, although the almost same operation and effectiveness as claim 7 is acquired, it creates the owner card containing the car data for specifying the car which this owner proper data and owner ordered, and transmits the contents of this owner card to a storage manufacturer's receiving means through a data transmitting means like claim 6, while ** Co. extracts owner proper data. A storage manufacturer stores owner proper data in a storage based on the

contents of the received owner card. And the owner proper data of this storage will be read through the storage read means connected and formed in the control means of the car supplied to owner based on the contents of the owner card, and will be transmitted to a control means.

[0026] In the control gain modification equipment of claim 9, the owner proper data relevant to operation of the owner who ordered the car from the semiconductor integrated circuit component are memorized, and a control gain modification means by which this semiconductor integrated circuit component was incorporated changes the control gain of the control unit owner's car based on the owner proper data memorized for the semiconductor integrated circuit component. Since a semiconductor integrated circuit component is made to memorize owner proper data, the same operation and effectiveness as claim 1 are acquired fundamentally.

[0027] Owner proper data are read and memorized by the data-storage means through a storage read means, and a control gain modification means to by_which a data-storage means was incorporated changes the control gain of the control unit of a car into it in the control gain modification equipment of claim 10 based on the owner proper data memorized for the data-storage means from the storage which made the owner proper data relevant to operation of the owner who ordered the car memorize. Thus, owner proper data are read in a storage through a storage read means, and in order to make the data storage means with which the car was equipped memorize, the same operation and effectiveness as claim 3 are acquired.

[0028] The owner proper data relevant to operation of the owner who ordered the car are memorized by the storage in a storage manufacturer, and a control gain modification means to by_which said storage was connected to the storage read means with which it is equipped free [attachment and detachment] changes the control gain of the control unit of a car into it based on this owner proper data in the control gain modification equipment of claim 11 in response to the owner proper data read in the storage with the storage read means. Owner proper data can be economically stored in the storage of what needs to form a storage read means in a car efficiently certainly, and the same operation and effectiveness as claim 5 and abbreviation are acquired.

[0029]

[Example] Hereafter, the example of this invention is explained, referring to a drawing. The control gain modification system of the automobile explained below is a system which changes the control gain of the drive system of an automobile, a suspension system, and a steering system into the desired control characteristic, and includes the control gain modification approach. next, the whole control unit **** of an automobile -- it ****** just. As shown in drawing 1 , **, such as a car body 2, a front wheel 3, a rear wheel 4, an engine 5, an automatic transmission 6, active suspension equipment 7, the power-steering equipment 9 connected with the steering handle 8, the rear wheel power steering system 10, the brake gear 11 of an order ring, and the same various equipment devices (a fuel supply system, power window equipment, a sunroof, sheet equipment, electric mirror equipment, an air conditioner, instrument panel) as the usual automobile, are prepared in the automobile 1 at least.

[0030] furthermore, in an automobile 1, as two or more each part control units which are the control unit for automobiles The engine control system 12 (EGI) which controls the inspired air volume of an engine 5, ignition timing, and fuel oil consumption at least, respectively, The automatic gear change mechanism equipment 16 (EAT) which controls an automatic transmission 6, and the active-suspension-control equipment 13 (ACS) which controls the active suspension equipment 7 of a front wheel 3 and a rear wheel 4, The four-flower steering control unit 14 (4WS) which controls the rear wheel power steering system 10 which steers a rear wheel 4, and the power-steering control unit 15 (P/S) which controls the power-steering equipment 9 which assists the steering handle 8 are formed.

[0031] Here, base control gain is beforehand set to each part control devices 12-16 by the automaker, respectively, and control gain is changed into them by carrying out the multiplication of the control gain correction factor (henceforth a control gain factor) for which it asks every each part control devices 12-15 other than each part control-device 16 to base control gain by the control gain modification system of this application. In addition, since the control performed by each part control units 12-16 is general control, the explanation is omitted.

[0032] Next, the control gain modification system formed in this automobile is explained. As shown in drawing 2 , the control gain modification system 20 consists of the control unit 21 (MPU) which makes a microcomputer and an input output interface a subject, ROM22 and RAM23, a liquid crystal display 24 and its display controller 25, Maine SW26 (in addition, SW is the abbreviated name of a switch), a cursor movement key 27 for moving cursor 24a (referring to drawing 10) of a display 24 vertically and horizontally, and Enter key 28 grade. The detecting signal from the sensors of the speed sensor 30 which detects the vehicle speed of an automobile in a control unit 21, the rudder-angle sensor 31 which detects a handle rudder angle, the road surface friction sensor 32 which detects a road surface friction condition, the lateral-acceleration sensor 33 which detects the lateral acceleration which acts on a car body, the vertical acceleration sensor 34 which detects the vertical acceleration which acts on a car body, the yaw rate sensor 35 which detects yaw REITO which acts on a car body, and fuel gage 36 grade is supplied.
[0033] Said control unit 21 is connected to each part control units 12-16, and ROM22, RAM23, Maine SW26, the cursor movement key 27, Enter key 28, and the display controller 25 grade are connected to the control unit 21.
[0034] Next, the owner proper data relevant to operation of the owner who ordered the automobile from ** Co. which sells an automobile are explained. Fundamentally, although this owner proper data is data entered in the 1st data entry list of 1st data entry forms 17 which hear from owner in ** Co. and are shown in drawing 3 ** Co. fills in the 2nd data entry list of 2nd data entry forms 18 which show the data about the 2nd which drives the automobile which owner purchased - the 5th driver (for example, owner him, a wife, a son, a daughter) to drawing 4 .
[0035] The directions for a data entry and data entry are indicated by the 1st data entry list shown in drawing 3 . To a data entry The question of five subparagraphs (sex, age, a vehicle history, the number of possession, use gestalt) and the reply column about owner-driver in an entry A term, and a data input format, The question of three subparagraphs (atmospheric temperature, a location, altitude) and the reply column about an operating environment in an input item B term, and a data entry format, The question of two subparagraphs (the main applications, the main fellow passengers) about the service condition in an entry C term, the reply column, the data entry format, and the question, the reply column and data entry format of three subparagraphs (operability, a degree of comfort, fuel consumption) about the desired engine performance in an entry D term are shown. The control gain factor for owner is calculated and called for like the after-mentioned based on the data as which the 1st data entry list was filled in.
[0036] The 2nd data entry list shown in drawing 4 is a thing for setting up the control gain factor of each part control units 12-15 for the 2nd - the 5th driver. It is EGI for every driver. A control gain factor and ACS A control gain factor and 4WS A control gain factor and P/S The subject name of a control gain factor, The selectable control gain factor (0.8 0.9 1.01.1 1.2) for every item is indicated, and putting a round mark on a desired control gain factor is directed. In addition, at drawing 4 , it is 0.8-1.2. Although the control gain factor of the range is chosen, it is not limited to this range, for example, it is 0.6-1.4. You may make it choose the control gain factor of the range.
[0037] Memory m1-m6, ..., a work area as shown in drawing 5 are established in said RAM23. In memory m1 The owner proper data as which said 1st data entry list is filled in carry out like the after-mentioned, and are stored. In memory m2 The control gain factor (FKe, FKa, FKw, and FKp) of each part control units 12-15 for owner carries out like the after-mentioned, and is stored. In memory m3 The control gain factor (FKe, FKa, FKw, and FKp) of each part control units 12-15 for the 2nd driver carries out like the after-mentioned, and is stored. In memory m4 The control gain factor (FKe, FKa, FKw, and FKp) of each part control units 12-15 for the 3rd driver carries out like the after-mentioned, and is stored. In memory m5 The control gain factor (FKe, FKa, FKw, and FKp) of each part control units 12-15 for the 4th driver carries out like the after-mentioned, and is stored. In memory m6 The control gain factor (FKe, FKa, FKw, and FKp) of each part control units 12-15 for the 4th driver carries out like the after-mentioned, and is stored.
[0038] At least, as shown in drawing 6 , input storing of the table data of the below-mentioned table 1 and Table 2, the below-mentioned control gain factor data-processing program for owner, the below-

mentioned control signal output-processing program, the below-mentioned control characteristic selection processing program, and the below-mentioned setting modification processing program is carried out beforehand at said ROM22. In addition, the control program of the display control for displaying on a display 24 if needed is also contained in these programs.

[0039] Next, the layered structure of the control mode which chooses or changes the control characteristic is explained through the display of a display 24 based on <u>drawing 7</u> . The "manufacturer control characteristic" is the mode in which the base control gain beforehand set as each part control devices 12-15 in the manufacturer who manufactured the automobile is specified, and all control gain factors (FKe, FKa, FKw, and FKp) are 1.0 in this mode. It is set up. "The custom-made control characteristic" has owner mode, the 2nd driver mode, the 3rd driver mode, the 4th driver mode, and the 5th driver mode.

[0040] In owner mode, the control gain of each part control units 12-15 is determined by the control gain factor for owner (FKe, FKa, FKw, and FKp) calculated based on owner proper data. In the 2nd - the 5th driver mode, the control gain of each part control units 12-15 is determined by the control gain factor (FKe, FKa, FKw, and FKp) set to the 2nd - the 5th driver, respectively. "Setting modification" has owner mode, the 2nd driver mode, the 3rd driver mode, the 4th driver mode, and the 5th driver mode. In owner mode, the control gain factor for owner (FKe, FKa, FKw, and FKp) can be changed, and the control gain factor (FKe, FKa, FKw, and FKp) set to the 2nd - the 5th driver, respectively can be changed in the 2nd - the 5th driver mode.

[0041] Next, the various display screens displayed on a display 23 are explained. The following display items consist of two or more screens SW which consist of a transparent electrode being established in the screen of said display 24, and operating the screen SW selectable. Three items of the "manufacturer control characteristic", "the custom-made control characteristic", and "setting modification" are displayed on the menu screen shown in <u>drawing 8</u> , and it can be chosen now as it by operating Screen SW corresponding to each display item. It can be chosen as the driver appointed screen shown in <u>drawing 9</u> by "owner" and operating Screen SW corresponding to [the display item of .. is displayed "the 5th driver" "the 4th driver" "the 3rd driver" "the 2nd driver", and] each display item.

[0042] In the setting modification input screen shown in <u>drawing 10</u> , they are EGI, ACS, 4WS, and P/S. About each, the selection range of a control gain factor (0.8-1.2) and Mark Misumi who directs the control gain factor set up now are displayed. In the case of owner mode, Mark Misumi will be displayed based on the data of memory m2, and, in the case of the 2nd - the 5th driver mode, he will be displayed based on the data of memory m3-m6, respectively.

[0043] Next, although the table data for determining the control gain factor for owner (FKe, FKa, FKw, and FKp) and control gain factor data processing for owner performed in a control unit 21 are explained based on owner proper data, this data processing is performed based on actuation of the staff of ** Co., before delivering owner an automobile. In addition, Sign Si (i= 1, 2, 3 ...) shows each step among the following drawings.

[0044]

[Table 1]

			制御ゲイン 補正係数	記号
A	(1) 性　別	男 女	1.0 0.8	a 1
	(2) 年　令	～20才 21　～30才 31　～50才 51才～	0.8 1.2 1.0 0.8	a 2
	(3) 車　歴	1.5年未満 5　年未満 5　年以上	0.8 1.0 1.2	a 3
	(4) 保有台数	1　台 2　台以上	0.9 1.0	a 4
	(5) 使用形態	オーナー専用 オーナー以外も使用	1.0 0.8	a 5

[0045]
[Table 2]

			制御ゲイン補正係数				記 号	
			EGI	ACS	4WS	P／S		
B	(1)	非寒冷地	1.0	1.0	1.0	1.0	b1	
		寒冷地	1.1	1.2	1.2	1.2		
	(2)	都市部	0.9	1.0	0.9	1.1	b21	b2
		近郊部	1.0	1.0	1.0	1.0	b22	
		田園部	1.2	1.2	1.1	0.9	b23	
		山間部	1.2	1.2	1.2	0.8	b24	
	(3)	高度 500m以上	1.2	0.8	0.9	0.8	b31	b3
		高度 300〜500m	1.1	0.9	0.9	0.9	b32	
		高度 100〜300m	1.0	1.0	1.0	1.0	b32	
		高度 〜100m以下	1.0	1.0	1.0	1.0	b33	
C	(1)	通勤	0.8	0.8	1.0	0.8	c11	c1
		レジャー	1.2	1.2	1.2	1.2	c12	
		買物	0.8	0.8	0.8	0.8	c13	
		営業	1.0	1.0	0.8	0.8	c14	
	(2)	同乗者 無し	1.0	1.0	1.0	1.0	c21	c2
		同乗者 子供	0.9	0.9	1.1	1.1	c22	
		同乗者 彼女（妻）	1.0	0.9	1.1	1.1	c23	
		同乗者 年輩者	0.8	0.8	1.1	1.2	c24	
D	(1)	機敏な運転感覚	1.2	1.2	0.8	1.0	d1	
		楽な操作	1.0	0.8	0.8	0.8		
		中間	1.0	1.0	1.0	0.9		
	(2)	スポーツカー感覚	1.2	1.2	1.2	1.2	d2	
		豪華なセダン感覚	1.1	0.9	1.1	1.0		
		中間	1.0	1.0	1.0	1.0		
	(3)	極力低燃費	0.8	1.0	0.8	0.8	d3	
		特に考慮しない	1.0	1.0	1.0	1.0		

[0046] The control gain factor corresponding to five subparagraphs of A term in said 1st data entry list

is as being shown in Table 1, and the control gain factor corresponding to three subparagraphs of B term, two subparagraphs of C term, and three subparagraphs of D term is as being shown in Table 2, and the table data of Table 1 and Table 2 are beforehand stored in ROM22. Fundamentally, from a viewpoint which prevents large modification of the property of an automobile, the control gain factor is set as the range of 0.8-1.2, as shown also in Table 2.

[0047] Here, it is EGI. EAT About control gain, control gain "smallness" is the direction of low fuel consumption, and control gain "size" is the power increase direction. ACS About control gain, control gain "smallness" is the degree-of-comfort rise direction (the direction of software), and control gain "size" is the driving stability rise direction (the hard direction). 4WS About control gain, control gain "smallness" is the small turn nature rise direction (the opposition gain increase direction), and control gain "size" is the driving stability rise direction (the inphase gain increase direction). P/S The control force of the direction where, as for control gain "smallness", a control force becomes light about control gain, and control gain "size" is the direction which becomes heavy.

[0048] The control gain factor of five subparagraphs of A term of Table 1 is a correction factor set up common to each part control units 12-15, it is equivalent to the common control gain factor which amends the amendment component decided by the control gain correction factor (control gain factor) of Table 2, and since the control gain factor of B term of Table 2, C term, and D term is a correction factor independently set as each part control units 12-15, respectively, it is equivalent to an individial control gain correction factor.

[0049] It is related with the control gain factor illustrated to Table 1. Next, as an inclination of an outline The direction which brings a gain factor "smallness" close to the amount reduction direction of control gain amendments, i.e., base control gain, the direction where a gain factor "size" gets away from the increment direction in the amount of control gain amendments, i.e., base control gain, -- it is -- a woman, a youth, elderly people, and a vehicle history -- the person less than in 1.5 etc. in view of not being so good at driving, a control gain factor sets up small -- having -- moreover, a 21-30-year-old person and a vehicle history -- the person for five years or more When a control gain factor is set up greatly and it uses it also the case where it is the one number of possession, and except owner, in view of being good at driving, in view of two or more persons using it, the control gain factor is set up small. Next, about the control gain factor illustrated to Table 2, in view of the viscous increase of low [mu] and oil in a cold district, saloon car feeling is raised, driving stability is raised, a sports-car intention is raised, and the control gain factor is set up from viewpoints, such as raising low fuel consumption and small turn nature, by the object for shopping, or the thing for business by the thing for commutation at the thing for leisure.

[0050] Although one control gain factor will be decided [about the 1st subparagraph of the column filled in by "0" and "1" in the 1st data entry list i.e., A term of Table 1, and B term of Table 2, and D term] from Table 1 and Table 2 here, respectively like a1-a5, and b1, d1-d3 Using the value of the control gain factor of Table 2, the weight of ranking is considered as follows and a control gain factor is determined about the column which inputs "ranking", i.e., the 2nd subparagraph of B term, the 3rd subparagraph, and C term of Table 2, by the operation. In this case, 10% of weight is given to 20% of weight, and the thing of the 4th place to the thing of the 1st place at 30% of weight, and the thing of the 3rd place at 40% of weight, and the thing of the 2nd place, and a control gain factor calculates.

[0051] For example, when it is the ranking of the city section (the 1st place), the suburbs section (the 2nd place), the country section (the 3rd place), and a mountain slope (the 4th place) in the 2nd subparagraph of B term, the control gain factor b2 of the 2nd subparagraph of B term is b21 -b24. Weighting is added and it calculates as follows for every control gain factor of each part control units 14, 16-18.

The control gain factor b3 of the 3rd subparagraph of a $b2=0.4 xb21+0.3 xb22+0.2 xb23+0.1 xb24B$ term also adds weighting of ranking to said this appearance. EGI, ACS, 4WS, and P/S It calculates for every control gain factor, and the control gain factor c1 of the 1st subparagraph of C term is also multiplier c11 -c14. Use and weighting of ranking is added to said this appearance. EGI, ACS, 4WS, and P/S It calculates for every control gain factor, and the control gain factor c2 of the 2nd subparagraph

of C term is also correction factor c21 -c24. Use and weighting of ranking is added to said this appearance. EGI, ACS, 4WS, and P/S It calculates for every control gain factor.

[0052] Next, with the flow chart of <u>drawing 11</u> , although control gain factor data processing for owner is explained Control is substantially started by turning ON at coincidence the need [of starting control based on a specific command] top SW26, for example, Maine, and Enter key 28 (S10:Yes). Next, owner proper data are read from the memory m1 of RAM23 (S11), next it sets to S12. owner proper data -- using -- EGI, ACS, 4WS, and P/S Control gain factor b2e of a sake, b2a, b2w, and b2p Control gain factor b3e, b3a, b3w, and b3p Control gain factor c1e, c1a, c1w, and c1p Control gain factor c2e, c2a, c2w, and c2p Weighting of ranking is added and calculated as mentioned above. In addition, the subscripts e, a, w, and p of a tail are EGI, ACS, 4WS, and P/S, respectively. It corresponds. In this way, EGI, ACS, 4WS, and P/S The control gain factor of all the items of related Table 2 is decided. Namely, EGI As a control gain factor of all items, they are b1e, b2e, b3e, c1e, c2e, d1e, d2e, and d3e. It is decided and they are ACS, 4WS, and P/S. The same is said of a control gain factor.

[0053] Next, in S13, the control gain factor of all the items of Table 2 is used, and they are EGI, ACS, 4WS, and P/S. The compound control gain factors Ke, Ka, Kw, and Kp calculate by the degree type. Ke=b1e xb2e xb3e xc1e xc2e xd1e xd2e xd3 eKa=b1a xb2a xb3a xc1a xc2a xd1a xd2a xd3 aKw=b1w xb2w xb3w xc1w xc2w xd1w xd2w xd3 wKp=b1p xb2p xb3p xc1p xc2p xd1p xd2p xd3p[0054] Next, they are EGI, ACS, 4WS, and P/S by carrying out the multiplication of the control gain factors a1-a5 of Table 1 to the amount component of amendments of the compound control gain factors Ke, Ka, Kw, and Kp in S14, respectively. The last control gain factor FKe, FKa, FKw, and FKp It calculates by the degree type. FKe =1.0+(Ke-1.0) xa1xa2xa3xa4xa5FKa =1.0+(Ka-1.0) xa1xa2xa3xa4xa5FKw =1.0+(Kw-1.0) xa1xa2xa3xa4xa5FKp = The control gain factors FKe and FKa for owner for which it asked as mentioned above in 1.0+(Kp-1.0) xa1xa2xa3xa4xa5, next S15, FKw, and FKp If data are stored in memory m2, this data processing will be completed.

[0055] Next, control signal output processing performed in case owner uses an automobile is explained. If this control signal output processing is started by the injection of Maine SW26 as shown in <u>drawing 12</u> , it will set to S20. The menu screen of <u>drawing 8</u> is displayed on a display 24, and it sets to this menu screen. If ON actuation of Screen SW of the manufacturer control characteristic is carried out, it will set to S22. The manufacturer control characteristic is chosen, then, it sets to S23, and they are the control gain factor FKe, FKa, FKw, and FKp. It is 1.0 altogether. The control signal to carry out is outputted to each part control units 12-15, and carries out a return after that. However, the flag which specifies the manufacturer control characteristic will be set in fact, and said control signal will be repeatedly outputted based on the flag.

[0056] The driver appointed screen of <u>drawing 9</u> is displayed on a display 24, and it sets on this driver appointed screen. on the other hand, in a menu screen, Screen SW of the custom-made control characteristic carries out ON actuation -- having (S24:Yes) -- It shifts to S27. owner's Screen SW carries out ON actuation -- having (S26:Yes) -- The control gain factor FKe for the owner from memory m2, FKa, FKw, and FKp It is read. These control gain factor FKe, FKa, FKw, and FKp It is outputted to each part control units 12-15, respectively, and a corresponding control signal (control gain modification signal) carries out a return after that, and is performed repeatedly. However, the flag which specifies the control characteristic for owner will be set in fact, and said control signal will be repeatedly outputted based on the flag.

[0057] in said driver appointed screen, Screen SW of the 2nd driver carries out ON actuation -- having (S28:Yes) -- S29 -- shifting -- the control gain factor FKe for the 2nd driver from memory m3, FKa, FKw, and FKp It is read. These control gain factor FKe, FKa, FKw, and FKp It is outputted to each part control units 12-15, respectively, and a corresponding control signal carries out a return after that, and is performed repeatedly. However, the flag which specifies the control characteristic for the 2nd driver will be set in fact, and said control signal will be repeatedly outputted based on the flag.

[0058] Hereafter, similarly, in S30-S34, if the 3rd driver is chosen The control gain factor FKe of memory m4, FKa, FKw, and FKp If a corresponding control signal is outputted and the 4th driver is

chosen The control gain factor FKe of memory m5, FKa, FKw, and FKp If a corresponding control signal is outputted and the 5th driver is chosen The control gain factor FKe of memory m6, FKa, FKw, and FKp A corresponding control signal is outputted, and a return is carried out after that and it performs repeatedly. A flag is set to said this appearance also in these cases, and a control signal is repeatedly outputted based on the flag. In this way, if control which will be made into the control gain for owner if control by the base control gain set up in the manufacturer when the manufacturer control characteristic was chosen is performed and owner is chosen is performed and the 2nd - the 5th driver are chosen, control made into the control gain the 2nd - for the 5th driver will be performed, respectively.

[0059] Next, the control characteristic selection processing performed with a control unit 21 is explained. This control characteristic selection processing is processing always performed during transit of an automobile, and in order to secure driving stability at the time of a specific run state, it is processing for forbidding application of the custom-made control gain for owner - the 5th driver. As shown in drawing 13 , when various required signals are read into the beginning in the following control (S60), the vehicle speed V The judgment of being more than predetermined value V0 (S61), Road surface friction with the judgment (S62) of being beyond a predetermined value The judgment of being low friction (low [mu]) (S63), [lateral acceleration G] The judgment (S64) of being a bad road based on the detecting signal from the vertical acceleration sensor 86, the judgment (S65) of being a system fail, and the judgment (S66) of whether there is little remaining fuel are made. In addition, a system fail is that trouble occurred in the control unit 21, by predetermined system-diagnosis control, during transit of an automobile, the existence of system fail generating is always judged, and the judgment of S65 is made based on the judgment result.

[0060] When all the conditions of that it is vehicle speed V<V0, that it is lateral acceleration G<G0, that it is not a low mu way, that it is not a bad road, that it is not a system fail, and being [little remaining fuel] ** are satisfied, in S67, it is decided that it will be custom-made control characteristic application authorization, and a return is carried out after that. Moreover, when said all conditions are satisfied and it is except, in S68, it is decided that it will be the ban (the manufacturer control characteristic is applied) on custom-made control characteristic application, and then the command which applies the manufacturer control characteristic is outputted to said control signal output processing in S69.

[0061] Thus, it sets to the judgment of S61-S66, and is Yes. Although it is not impossible to apply the custom-made control characteristic to the bottom of a specific run state which becomes, since an unsuitable setup etc. may be included in the custom-made control characteristic, it constitutes from viewpoints, such as driving stability, so that application of the custom-made control characteristic may be forbidden.

[0062] Next, setting modification processing in which the control gain factor of said custom-made control characteristic (the object for owner, the 2nd driver - for the 5th driver) is changed is explained. if it is the processing performed in the condition stopped the engine of an automobile, with a control unit 21 and processing is started by the injection of Maine SW26, the menu screen of drawing 8 will display this setting modification processing -- having (S40) -- a degree -- that menu screen -- setting -- Screen SW of setting modification -- ON actuation -- carrying out (S41:Yes) -- the driver appointed screen shown in a display 24 at drawing 9 is displayed.

[0063] next, this driver appointed screen -- setting -- owner's Screen SW -- ON actuation -- carrying out (S43:Yes) -- it shifts to S40. At S40, they are the control gain factor FKe of memory m2, FKa, FKw, and FKp. Data are read and the setting modification input screen shown in a display 24 below at drawing 10 is displayed. However, Mark Misumi in this screen is the control gain factor FKe read from memory m2, FKa, FKw, and FKp. It is displayed on the location corresponding to a value.

[0064] Next, EGI, ACS, 4WS, and P/S When a control gain factor is set up by operating Enter key 28 in the condition of having directed in order the value of the request which sets up a control gain factor by cursor 24a one by one, Mark Misumi is displayed on the location of the value of the set-up control gain factor, and the data (setting data) of the set-up control gain factor are stored in memory m2. Next, the control characteristic screen shown in a display 24 at drawing 15 is displayed, and setting modification processing is ended after that.

[0065] on the other hand -- the driver appointed screen -- setting -- Screen SW of the 2nd driver -- ON actuation -- carrying out (S45:Yes) -- it shifts to S46. Although the same processing as S40 is performed in S46, they are the control gain factor FKe of MERIMO m3, FKa, FKw, and FKp in this case. The control gain factor FKe which data were read, and a modification setup of that data was carried out, and was changed, FKa, FKw, and FKp Data are stored in MERIMO m3.

[0066] Hereafter, in S47, S48 and S49, and S50, S51 and S52, the same processing as S45, S46, and abbreviation is performed, respectively. However, when the 3rd driver is specified, a modification setup of the data of memory m4 is carried out, when the 4th driver is specified, a modification setup of the data of memory m5 is carried out, and when the 5th driver is specified, a modification setup of the data of memory m6 will be carried out. In addition, the last data before modification and this time data after modification are stored in memory m2-m6, respectively.

[0067] Here, supplementary information is carried out about the control characteristic screen of drawing 15 . The last control gain factor FKe of last time and this time, FKa, FKw, and FKp The comment of the General Council of Trade Unions is displayed. [screen / this / control gain-characteristics] [control units / 12-15 / each part] In addition, the last control gain factor FKe, FKa, FKw, and FKp It is displayed with a bar graph, respectively, and a dotted line is the level of "1.0" equivalent to the base control gain set up by the manufacturer, "old things" shows the last control gain factor, and "it is new" shows this control gain factor.

[0068] It is related with the technique which displays said General Council of Trade Unions comment, and is EGI. It corresponds to the Konaka size of a control gain factor. "Low fuel consumption", "Common", "high power", and ACS It corresponds to the Konaka size of a control gain factor. "Improvement in a degree of comfort", "Common", "improvement in driving stability", and 4WS It corresponds to the Konaka size of a control gain factor. "On a small turn disposition", "Common", "improvement in driving stability", and P/S It corresponds to the Konaka size of a control gain factor. "********", "Usually" data for a display, such as a "control-force pile", and the data for a display of a message always displayed will make the program of setting modification processing accompany, and will be memorized beforehand, and various kinds of aforementioned display messages will be chosen and displayed according to a control gain factor. This control characteristic distinction control is explained.

[0069] If the case of the control characteristic screen in said S44 is explained as an example as shown in drawing 16 , the data of a control gain factor (FKe, FKa, FKw, FKp) are first read from memory m2 (S80), and then it is the control gain factor FKe. It is judged into smallness to which [adult] it corresponds (S81). Next, control gain factor FKe It is made to correspond to size into smallness, respectively, and is EGI. The contents of a display of a property multiplier FKe the time of being smallness -- "low fuel consumption" and multiplier FKe the time of being inside -- "-- usually -- " -- multiplier FKe It is decided at the adult time that it will be "high power" (S82-83), and the display-control signal for making it display on a display 24 according to this decision is outputted to a display controller 25.

[0070] Next, control gain factor FKa It is judged into smallness to which [adult] it corresponds (S85). Next, control gain factor FKa It is made to correspond to size into smallness, respectively. The contents of a display of an ACS property Multiplier FKa When it is smallness, they are "improvement in a degree of comfort", and a multiplier FKa. When it is inside, "usually" Multiplier FKa It is decided at the adult time that it will be "improvement in driving stability" (S86-88), and the display-control signal for making it display on a display 24 according to this decision is outputted to a display controller 25.

[0071] Next, control gain factor FKp It is judged into smallness to which [adult] it corresponds (S89). next, control gain factor FKp it corresponds to size into smallness, respectively -- making -- the contents of a display of a P/S property -- multiplier FKp the time of being smallness -- "********" and multiplier FKp the time of being inside -- "-- usually -- " -- multiplier FKp It is decided at the adult time that it will be a "control-force pile" (S90-92). Next, control gain factor FKw It is judged into smallness to which [adult] it corresponds (S93). Next, control gain factor FKw It is made to correspond to size into smallness, respectively. The contents of a display of 4WS property Multiplier FKw When it is

smallness, they are a "small turn disposition top" and a multiplier FKw. When it is inside, "usually" Multiplier FKw It is decided at the adult time that it will be "improvement in driving stability" (S94-96), and the display-control signal for making it display on a display 24 according to this decision is outputted to a display controller 25.

[0072] It is the control gain factor FKe next. It is judged into smallness to which [adult] it corresponds (S97). Next, control gain factor FKe It is made to correspond to size into smallness, respectively. The contents of a display of the overall characteristic multiplier FKe the time of being smallness -- "please run slowly" and multiplier FKe the time of being inside -- "please run ordinarily" -- Multiplier FKe "Please run lightly" is determined at the adult time (S98-100), and the display-control signal for making it display on a display 24 according to this decision is outputted to a display controller 25.

[0073] Next, how to store in said RAM23 the various data shown in drawing 5 among the control gain modification approaches of this application is explained. Since it is common to many automobiles of the same type of a car except RAM23 in which owner proper data and other data are stored among said control gain modification systems 20, although it is not necessary to make it differ for every owner and will be manufactured in common, the explanation about this is omitted. Here, since RAM23 in which the owner proper data shown in drawing 5 and other data (henceforth owner data) are stored differs for every owner who ordered the automobile, it becomes important how owner data are efficiently stored in RAM23 economically.

[0074] Then, although owner data are stored in RAM23, any one of three kinds of the approaches which are explained below is applicable. In the following explanation, ** Co. is the dealer of the automobile which took the order from owner. In addition, MM manufacturer He is the semiconductor integrated circuit manufacturer who manufactures ROM22 and RAM23. CB manufacturer Control unit for automobiles which owner purchased (EGI, ACS, 4WS, and P/S are included) He is the control box manufacturer who manufactures the control box containing at least a part and a control gain modification system. A car manufacturer is an automaker which manufactures the automobile which owner ordered. The data transceiver machine which performs transmission and reception of data is prepared for said ** Co., the car manufacturer, MM manufacturer, and CB manufacturer, respectively, and data can be transmitted and received now by these mutuals.

[0075] 1) As shown in drawing 17 , when owner orders an automobile from ** Co., ** Co. determines the control gain factor of each part control units 12-15 which the 2nd - the 5th driver wish as the 2nd data entry list which hears from owner and its family, and enters owner proper data in the 1st data entry list shown in drawing 3 , and is shown in drawing 4 . Next, ** Co. is reference number and car-body No. and ** Co. code No. to this owner card, while entering the owner data which consist of owner proper data of the 1st data entry list, and control gain factor data of the 2nd data entry list in the owner card which consists of the data file and data entry form of a computer. It enters. And ** Co. transmits the contents (filled-in data) of this owner card to MM manufacturer's data transceiver machine with a data transceiver vessel.

[0076] Next, based on the contents of said received owner card, MM manufacturer writes owner data in the semiconductor integrated circuit component (henceforth IC component) which is said RAM23, next supplies the IC component to CB manufacturer with the contents of the owner card. In addition, IC component shall be backed up with a dc-battery. Next, CB manufacturer includes in the control gain modification system 20 of the control box carried in the automobile by which owner placed an order for the IC component based on the directions from the contents and the car manufacturer of an owner card, and supplies a control box to a car manufacturer with the contents of the owner card. Next, since a car manufacturer attaches a control box to the automobile supplied to owner and completes an automobile, the automobile is supplied to ** Co. Next, ** Co. delivers owner the automobile.

[0077] According to this method, it becomes possible to certainly store owner data in IC component efficiently economically using one set or several sets of the specific devices for writing prepared for MM manufacturer. However, it is not necessary to write owner data in IC component in MM manufacturer, owner data are not necessarily supplied to CB manufacturer via a car manufacturer, and you may make it write owner data in IC component in CB manufacturer.

[0078] 2) IC component which made owner data memorize in MM manufacturer is supplied to MM manufacturer empty vehicle both manufacturers, and you may make it attach the IC component to the control gain modification system 20 of the control box of the automobile supplied to owner in a car manufacturer, as shown in drawing 18 .

3) IC component which made owner data memorize in MM manufacturer is supplied from MM manufacturer to ** Co., and you may make it attach the IC component to the control gain modification system 20 of the control box of the automobile supplied to owner in ** Co., as shown in drawing 19 .

[0079] In addition, in this example, although it constituted so that owner data might be stored in RAM23, storage maintenance of the owner data can be carried out by backing up RAM23 with a dc-battery in this case. Thus, instead of the method which stores owner data in RAM23, can also constitute so that ROM with said another ROM22 or ROM22 may be made to memorize owner data, and in this case, although only the part which does not need to back up that ROM with a dc-battery is advantageous In this case, since the data of the control gain factor for owner (FKe, FKa, FKw, and FKp) shown in drawing 5 cannot be written in that ROM, RAM23 is made to memorize this data for owner. And although owner data shall be written in ROM which stores owner data in MM manufacturer or CB manufacturer also in this case, that ROM shall be attached to the control gain modification system 20 of the control box of the automobile supplied to owner in CB manufacturer, a car manufacturer, or ** Co.

[0080] The following operation and effectiveness are acquired in the control gain modification system of the control unit of an automobile and the control gain modification approach concerning this example. Based on said owner proper data, the control gain of each part control units 12-15 can be changed so that owner's operation, the purpose of use and use mode, and a desired property may be suited. Furthermore, since not only the control characteristic for owner but two or more kinds of control characteristics the 2nd - for the 5th driver can be set up, it excels in versatility. In addition, when it is the automobile which only owner uses, you may make it set up for example, the control characteristic for highways, the control characteristic for bad roads, the control characteristic for mountain paths, and the control characteristic for driving as the 2nd - the control characteristic for the 5th driver, respectively.

[0081] Furthermore, since it constituted so that the custom-made control characteristics, such as said control characteristic for owner, and the 2nd - the control characteristic for the 5th driver, could be freely changed in the mode of setting modification, the custom-made control characteristic can be changed according to fluctuation of situations, such as improvement in owner's operation workmanship, and relocation of a dwelling. Moreover, in MM manufacturer or CB manufacturer, since the method which writes owner data in IC component (RAM23) was adopted, owner data can be written in IC component efficiently and economically.

[0082] Next, although the 1st exception example which changed said a part of example is explained referring to drawing 20 - drawing 23 , a mainly different configuration from said example is explained. As shown in drawing 20 , the control gain modification system 20 is the same as that of the thing of said example. Although said owner data are stored in RAM23, in the case of this example, owner data shall once be written for owner data in IC card 40 as a storage through the IC card reader 41 (IC card reading machine) from writing and its IC card 40 at RAM23. Also in the case of this method, any one of three kinds of the approaches as follows is employable. In addition, IC card 40 is an IC card which consists of an IC card which consists of RAM, or a ROM.

[0083] 1) if the contents of the owner card containing owner data are transmitted to MM manufacturer's data transceiver machine from the data transceiver machine of ** Co. as shown in drawing 21 -- MM manufacturer -- the contents of the owner card -- being based -- IC card writer (IC card write-in vessel) -- minding -- IC card 40 as a memory medium -- owner data -- writing and its IC card 40 -- the contents of the owner card -- ** -- both supply CB manufacturer.

[0084] Next, in CB manufacturer, based on the contents of the owner card, the owner data stored in IC card 40 are stored in RAM23 of the control gain modification system 20 attached to the control box of the automobile supplied to owner using the IC card reader 41, and the control box is supplied to a car manufacturer. Next, in a car manufacturer, the control box is attached to the automobile supplied to owner, the automobile is completed, and ** Co. is supplied. ** Co. delivers owner the automobile. In

addition, the contents of the owner-data **** owner card are transmitted to CB manufacturer from ** Co., and you may make it write owner data in an IC card from writing and its IC card in CB manufacturer also in this case at RAM23.

[0085] 2) Store in RAM23 of the control gain modification system 20 attached to the control box of the automobile supplied to owner in the owner data which connected [in / store / in / as shown in drawing 22 / MM manufacturer / owner data in an IC card, supply the IC card 40 to a car manufacturer, and / the car manufacturer] the IC card reader 41 free [attachment and detachment to the control gain modification system 20], and were stored in IC card 40 through the IC card reader 41, and remove the IC card reader 41 after that. Others are the same as that of the case of 1.

[0086] 3) As shown in drawing 23 , store owner data in IC card 40 in MM manufacturer, and supply the IC card 40 to ** Co. Next, ** Co. connects the IC card reader 41 to the control gain modification system 20 free [attachment and detachment] after arrival of the automobile supplied to owner, and it writes the owner data stored in IC card 40 through the IC card reader 41 in RAM23 of the control gain modification system 20 attached to the control box of the automobile. The IC card reader 41 is removed after that. Others are the same as that of the case of 1.

[0087] If the IC card which consists of RAM is applied as said IC card 40 in this another example, can repeat and use that IC card 40 and by MM manufacturer One set or several sets (IC card write-in vessel) of IC card writers are used. Can write owner data in IC card 40 efficiently and economically, and moreover, CB manufacturer, a car manufacturer, or ** Co. Only by holding one set or several sets of the IC card readers 41, owner data are storable in RAM23 efficiently and economically. In addition, as said storage, optical disks, such as a magnetic disk, a magnetic card, a magnetic tape, and CD-ROM, other various storages, etc. are also employable instead of IC card 40.

[0088] Next, although the 2nd exception example which changed said a part of example is explained referring to drawing 24 - drawing 26 , a mainly different configuration from said example is explained. As shown in drawing 24 , the IC card reader 38 connected to the control unit 21 and IC card 37 with which said owner data are stored are formed in the control gain modification system 20 still more nearly additionally. Although the owner data stored in said IC card 37 are stored in RAM23, also in the case of this example, any one of two kinds of the approaches as follows is employable.

[0089] 1) If the contents of the owner card containing owner data are transmitted to MM manufacturer's data transceiver machine from the data transceiver machine of ** Co. as shown in drawing 25 , through IC card writer, based on the contents of the owner card, owner data will be supplied to writing and the IC card 37 will be supplied to a car manufacturer with the contents of the owner card by MM manufacturer at IC card 37 as a memory medium. Next, in a car manufacturer, since the IC card reader 38 of the control gain modification system 20 attached to the control box of the automobile supplied to owner is equipped with IC card 37, the owner data stored in IC card 37 are stored in RAM23 and the automobile is completed, the automobile is supplied to ** Co. Next, ** Co. delivers owner the automobile.

[0090] 2) If owner data are supplied to MM manufacturer from ** Co. as shown in drawing 26 , by MM manufacturer, owner data will be supplied to writing and the IC card 37 will be supplied to ** Co. with the contents of the owner card at IC card 37 as a memory medium. Next, ** Co. equips the IC card reader 38 of the control gain modification system 20 attached to the control box of the automobile after receipt with the automobile supplied to owner from a car manufacturer, it stores in RAM23 the owner data stored in IC card 37, and delivers owner the automobile. In this another example, owner data can be written in IC card 40 efficiently and economically by MM manufacturer using one set or several sets of IC card writers. In addition, as said storage, said various storages are also employable instead of IC card 40.

[0091] Next, although the 3rd exception example which changed said a part of example is explained referring to drawing 27 , a mainly different configuration from said example is explained. The data entry list of 3rd data entry forms 19 of illustration is also employable instead of said 1st data entry form 17 at drawing 27 . This data entry list is the thing of the method which carries out a direct entry setup of the control gain factor. Are suitable for the driver which has remarkable knowledge about an automobile.

Like illustration An engine property (inspired air volume, fuel oil consumption, ignition timing), the gear change property of an automatic transmission, To each of items, such as a brake property, the TCS control characteristic of traction control, the ABS property of anti-lock brake control, a power-steering property, a rear wheel steering property, and an air-conditioning property 0.8, 0.9, 1.0, 1.1, and 1.2 All or some control gain factors are enumerated, a round mark is put and chosen as one control gain factor for every item, and the selected owner proper data is supplied to said MM manufacturer.

[0092] Said MM manufacturer will write the owner data containing the owner proper data in IC component or an IC card. However, when applying this owner proper data, it is required to connect said control unit 21 also to the braking control unit which controls a damping device, and the air-conditioning control unit which controls an air conditioner in addition to said each part control units 12-16, and to constitute with the control signal (control gain modification signal) from a control unit 21, so that the control gain of a braking control unit and an air-conditioning control unit can be changed.

[0093] When applying this data entry list, the contents of a display of a control characteristic screen shall also be changed, and it shall be constituted so that graphical representation of said engine property, the gear change property of an automatic transmission, a brake property, the TCS control characteristic of traction control, the ABS property of anti-lock brake control, a power-steering property, a rear wheel steering property, the air-conditioning property, etc. may be carried out.

[0094] Next, the various examples of modification which changed said a part of example are explained. 1] in said example, the control gain of EAT which controls an automatic transmission 6 is changed -- as -- although not constituted, it can constitute possible [modification of the control gain of EAT] like the control gain of each part control units 12-15 by setting the control gain factor of EAT as Table 2.

[0095] 2] To said custom-made control characteristic mode and setting maintenance mode, like the switch of the 2nd - the 5th driver The mode corresponding to the class of road of a city area, the suburban ground, a mountain path, a low mu way, a snowy road, etc. is formed. Like the case of the 2nd - the 5th driver with a data entry list Set up the control characteristic corresponding to those modes, and the owner data containing those control gain factor data are supplied to MM manufacturer. Like said various examples, those data can be stored in RAM3, and it can also constitute so that the control gain of each part control units 12-15 may be changed with the control characteristic according to the class of road it runs.

[0096] 3] the control gain characteristics of the TCS control unit which controls the ABS control unit and traction control equipment which control antilock wafer breaking equipment by said example are set up according to a rank -- as -- although not constituted, it is also possible to constitute so that it may set up about these control gain characteristics as well as the control characteristic of each part control units 12-15.

4] In the range which does not deviate from the technical thought of this invention, various modification may be added to the control gain modification system of this invention based on the existing technique or a technique obvious for this contractor.

[Translation done.]

* NOTICES *

**JPO and NCIPI are not responsible for any
damages caused by the use of this translation.**

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram of the control unit of the automobile concerning an example.
[Drawing 2] It is the block diagram of the control gain modification system of the automobile of drawing 1 .
[Drawing 3] It is the explanatory view of the 1st data entry list of 1st data entry forms.
[Drawing 4] It is the explanatory view of the 2nd data entry list of 2nd data entry forms.
[Drawing 5] It is the explanatory view of the DS of RAM23.
[Drawing 6] It is the explanatory view of the list of programs stored in ROM22.
[Drawing 7] It is the explanatory view of the layered structure of the control mode.
[Drawing 8] It is the explanatory view of the menu screen displayed on the display.
[Drawing 9] It is the explanatory view of the driver appointed screen displayed on the display.
[Drawing 10] It is the explanatory view of the setting modification input screen displayed on the display.

[Drawing 11] It is the flow chart of control gain factor data processing for owner.
[Drawing 12] It is the flow chart of control signal output processing for control gain modification.
[Drawing 13] It is the flow chart of control characteristic selection processing.
[Drawing 14] It is the flow chart of setting modification processing.
[Drawing 15] It is the explanatory view of the control characteristic side displayed on the display.
[Drawing 16] It is the flow chart of control characteristic distinction processing.
[Drawing 17] It is a process explanatory view about the approach of storing owner data in IC component.
[Drawing 18] It is a process explanatory view about the approach of storing owner data in IC component.
[Drawing 19] It is a process explanatory view about the approach of storing owner data in IC component.
[Drawing 20] It is the drawing 2 equivalent Fig. concerning the 1st exception example.
[Drawing 21] It is a process explanatory view about the approach of storing owner data in RAM23 through an IC card.
[Drawing 22] It is a process explanatory view about the approach of storing owner data in RAM23 through an IC card.
[Drawing 23] It is a process explanatory view about the approach of storing owner data in RAM23 through an IC card.
[Drawing 24] It is the drawing 2 equivalent Fig. concerning the 2nd exception example.
[Drawing 25] It is a process explanatory view about the approach of storing owner data in an IC card and building the IC card into a control gain modification system.
[Drawing 26] It is a process explanatory view about the approach of storing owner data in an IC card and building the IC card into a control gain modification system.
[Drawing 27] It is the drawing 3 equivalent Fig. concerning the 3rd exception example.

[Description of Notations]
12 Engine Control System (EGI)
13 Active-Suspension-Control Equipment (ACS)
14 Four-Flower Steering Control Unit (4WS)
15 Power-Steering Control Unit (P/S)
17 1st Data Entry Form
18 2nd Data Entry Form
19 3rd Data Entry Form
20 Control Gain Modification System
21 Control Unit
22 ROM
23 RAM
37 40 IC card
38 41 IC card reader

[Translation done.]